Trend Study 22-12-98

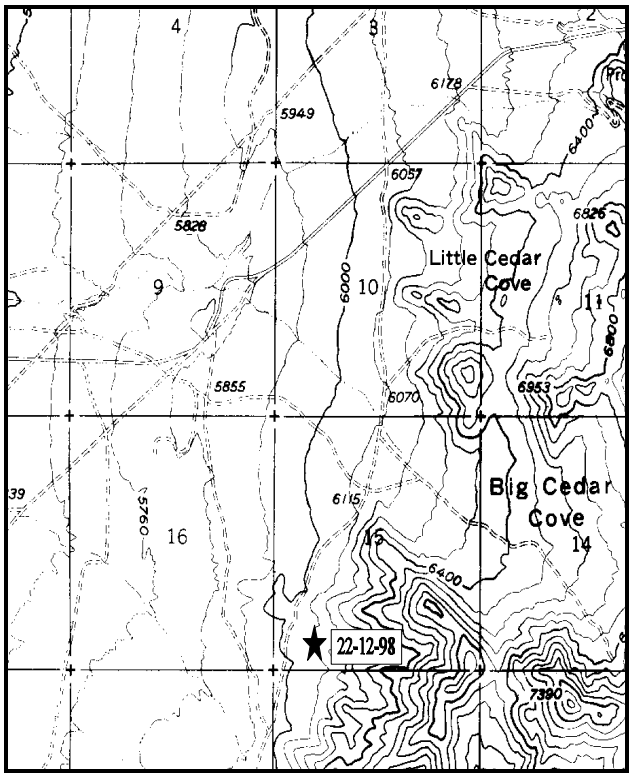
Study site name: Big Cedar Cove . Range type: Big Sagebrush-Grass .

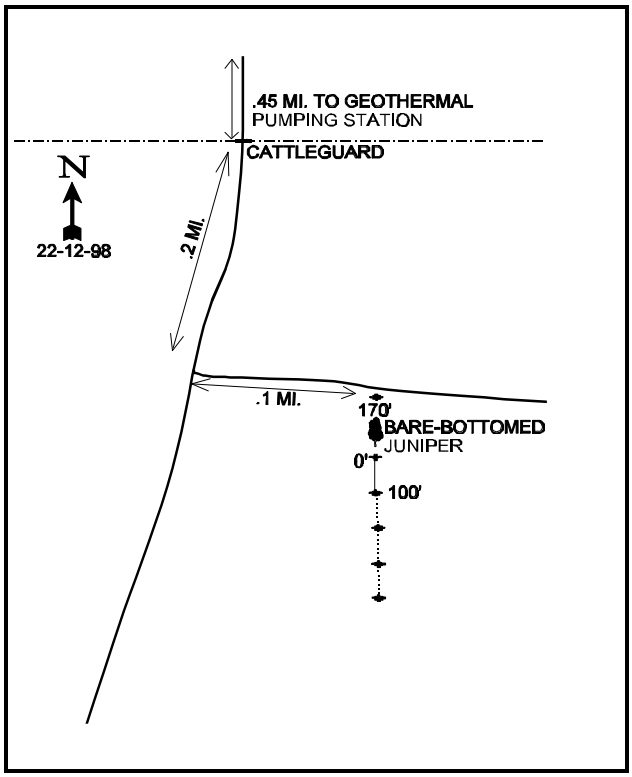
Compass bearing: frequency baseline 180 degrees.

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From mile marker 4 on SR257 north of Milford, go 0.55 miles north. Turn right (Roosevelt Hot Springs Road) and drive 2.65 miles to a major fork. Continue straight and go 5.0 miles. Just across the cattleguards turn right and go 1.0 miles to a 4-way fork. Turn right and continue 0.45 miles (past Phillips Oil well-head on the right) to another cattleguard. Go another 0.20 miles to a junction. Turn left and drive 0.1 miles. Stop here. The transect starts 170 feet due south of the road beside a highlined juniper tree. The 0-foot baseline stake is a steel rebar three feet tall with a browse tag #7079 attached.





Map Name: Bearskin Mountain, Utah Diagrammatic Sketch

Township 27S , Range 9W , Section 15 UTM 4257959.182 N, 337936.683 E

DISCUSSION

Trend Study No. 22-12 (56C-1/48-12)

The Big Cedar Cove trend study is located on the sagebrush-grass range that covers the gentle slopes of the foothills on the west side of the Mineral Mountains. The study has a southwest exposure at an elevation of 6,000 feet. The site, along with most of the land on the Mineral Mountains, is administered by the BLM. The area is grazed by cattle in the spring, but the scarcity of water may limit use. Deer use appears light with 12 deer days use/acre and 6 cow days use/acre estimated in 1998 on a pellet transect read on the site. A geothermal plant is located nearby and has the potential to impact deer in the area through habitat loss and increased disturbance.

Soil textural analysis indicates a sandy loam soil with a neutral pH (6.7). The soil is relatively deep and coarse with 49% of the soil surface covered with pavement and rocks. Effective rooting depth (see methods) is 19 inches with a soil temperature of 45.4°F at 17 inches. Vegetative growth may be limited due to relatively low amounts of phosphorous (7.5 ppm). There are signs of pedestaling around the bunchgrasses and browse plants. The soil is slightly eroded, showing signs of sheet erosion which likely occurs during high intensity summer thunderstorms.

A moderately dense stand of Wyoming big sagebrush dominates the site. In 1985, close to 25% of the population were young plants, with 35% classified as decadent. No seedlings were found in 1991 with young plants accounting for 16% of the population. Furthermore, over half of the sagebrush on the site are were decadent (53%), a 34% increase, while plants classified as having poor vigor have increased to 39%. Currently, sagebrush canopy cover is estimated to be 16%. Mature sagebrush average 22 inches in height, display generally good vigor, and are light to moderately browsed. Although percent decadence has declined to 37% of the population, few seedling or young plants were encountered in 1998. The shrub interspaces are occupied by various invaders such as narrowleaf low rabbitbrush, broom snakeweed, prickly phlox, and young pinyon pine. Broom snakeweed density is currently estimated to be 10,080 plants/acre, a great increase from previous years. This species has a highly fluctuating density depending on weather patterns. Ephedra density is currently estimated to be 320 plants/acre and plants show moderate utilization. Point-centered quarter data from 1991 estimate 39 pinyon trees/acre and 16 Utah juniper trees/acre. In 1998, point-centered quarter data estimate 54 pinyon trees/acre and 19 Utah juniper trees/acre.

Perennial grasses occur mainly under the protection of sagebrush crowns. Nested frequency values have improved since 1985. The more common species are Sandberg bluegrass, galleta, and bottlebrush squirreltail. Cheatgrass appears as the most abundant herbaceous species, providing 36% of the herbaceous understory cover and 13% of the total vegetative cover. Only five forbs were sampled in 1985. Ten forbs were sampled during the 1991 and 1998 reading. Some of the more abundant forbs includes: long leaf phlox, low fleabane, and an astragalus species.

1985 APPARENT TREND ASSESSMENT

All of the soil trend parameters indicate a stable condition. Vegetative trend may be slowly declining as the populations of various undesirable plants, including pinyon pine and cheatgrass seem to be on the increase.

1991 TREND ASSESSMENT

The soil trend appears slightly down due to litter cover decreasing by 18% and bare ground increasing by over 50%. The key browse species, Wyoming big sagebrush, shows only a slight increase in population (3%), a decreased reproductive potential, increased decadence, and plants with poor vigor have increased to 39%. These factors all indicate a slightly downward trend. The trend for grasses and forbs are up due to increased nested frequency values, but it is still in very poor condition, especially for the forbs.

TREND ASSESSMENT
soil - slightly down
browse - slightly down
herbaceous understory - upward, but still poor condition

1998 TREND ASSESSMENT

The soil trend is slightly downward with a slight increase in percent bare ground, rock, and pavement cover. Due to a recent rainstorm in 1998, cryptogams were more easily identified and common, including mosses, lichens, and mushrooms. The browse trend is considered stable. The Wyoming big sagebrush population still exhibits relatively high percent decadency, but appears to be recovering from poor conditions reported in 1991. Although the broom snakeweed density has greatly increased, these are small plants and provide very little cover to the site. Broom snakeweed density can fluctuate highly and this population will likely show great increases and decreases in the future. The herbaceous understory trend is stable. The perennial herbaceous understory sum of nested frequency has changed very little since 1991.

TREND ASSESSMENT
soil - slightly downward
browse - stable, Wyoming big sagebrush percent decadence is still high
herbaceous understory - stable, but still poor condition

HERBACEOUS TRENDS --
Herd unit 22 , Study no: 12

Type	Species	Nested Frequency '85	'91	'98	Quadrat Frequency '85	'91	'98	Average Cover % '98
G	Aristida purpurea	13	17	19	6	9	8	.66
G	Bromus tectorum (a)	-	-	308	-	-	95	4.59
G	Hilaria jamesii	56	61	65	26	23	28	1.18
G	Oryzopsis hymenoides	-	4	5	-	2	3	.19
G	Poa secunda	a68	b116	b137	29	52	57	3.09
G	Sitanion hystrix	a41	b75	ab68	19	35	35	1.93
G	Stipa comata	a11	b29	a14	6	11	6	.16
Total for Annual Grasses		0	0	308	0	0	95	4.59
Total for Perennial Grasses		189	302	308	86	132	137	7.22
Total for Grasses		189	302	616	86	132	232	11.81
F	Agoseris glauca	3	-	-	1	-	-	-
F	Agoseris spp.	-	7	-	-	3	-	-
F	Arabis demissa	2	-	2	1	-	1	.00
F	Astragalus spp.	-	4	7	-	2	2	.06
F	Castilleja chromosa	-	-	3	-	-	2	.03
F	Calochortus nuttallii	1	5	1	1	2	1	.00
F	Crepis spp.	-	4	-	-	1	-	-
F	Delphinium nuttallianum	-	5	-	-	3	-	-
F	Erigeron pumilus	3	5	10	1	2	4	.59

Type	Species	Nested Frequency '85	'91	'98	Quadrat Frequency '85	'91	'98	Average Cover % '98
F	Lomatium spp.	-	1	2	-	1	2	.01
F	Lupinus argenteus	-	-	1	-	-	1	.00
F	Microsteris gracilis (a)	-	-	1	-	-	1	.00
F	Navarretia intertexta (a)	-	-	12	-	-	5	.05
F	Phlox longifolia	$_{a}$-	$_{b}$31	$_{b}$23	-	16	12	.11
F	Sphaeralcea coccinea	-	-	-	-	-	-	.00
F	Zigadenus paniculatus	3	-	-	1	-	-	-
Total for Annual Forbs		0	0	13	0	0	6	0.05
Total for Perennial Forbs		12	62	49	5	30	25	0.83
Total for Forbs		12	62	62	5	30	31	0.89

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 22 , Study no: 12

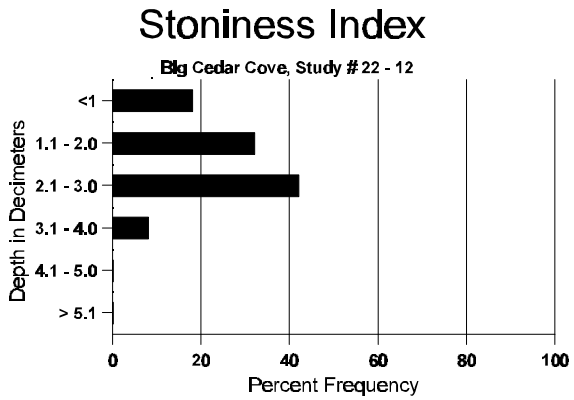
Type	Species	Strip Frequency '98	Average Cover % '98
B	Amelanchier utahensis	1	-
B	Artemisia tridentata wyomingensis	87	16.49
B	Chrysothamnus viscidiflorus stenophyllus	36	1.00
B	Ephedra fasciculata fasciculata	7	.74
B	Gutierrezia sarothrae	61	3.37
B	Juniperus osteosperma	1	-
B	Leptodactylon pungens	1	-
B	Opuntia spp.	7	-
B	Pinus edulis	3	.58
B	Ribes cereum cereum	1	-
Total for Browse		205	22.21

BASIC COVER --
Herd unit 22 , Study no: 12

Cover Type	Nested Frequency '98	Average Cover % '85	'91	'98
Vegetation	346	3.00	6.00	31.45
Rock	158	2.00	3.25	5.42
Pavement	352	37.50	35.75	43.72
Litter	386	51.25	42.25	36.46
Cryptogams	142	0	0	1.37
Bare Ground	298	6.25	12.75	13.13

SOIL ANALYSIS DATA --
Herd Unit 22, Study # 12, Study Name: Big Cedar Cove

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
18.8	45.4 (16.7)	6.7	62.7	20.7	16.6	1.8	7.5	96.0	.6



PELLET GROUP FREQUENCY --
Herd unit 22 , Study no: 12

Type	Quadrat Frequency '98
Rabbit	28
Deer	21
Cattle	1

BROWSE CHARACTERISTICS --
Herd unit 22 , Study no: 12

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'98	20		-

Artemisia tridentata wyomingensis																		
S	85	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	4	-	-	1	-	-	-	-	-	5	-	-	-	100			5
Y	85	9	4	-	-	-	-	-	-	-	13	-	-	-	866			13
	91	3	5	-	2	-	-	-	-	-	10	-	-	-	666			10
	98	1	-	-	1	-	-	-	-	-	1	1	-	-	40			2
M	85	5	18	3	-	-	-	-	-	-	26	-	-	-	1733	21	26	26
	91	1	10	1	3	4	-	-	-	-	19	-	-	-	1266	17	20	19
	98	71	36	-	-	-	-	-	-	-	105	-	1	-	2140	22	34	107
D	85	1	16	4	-	-	-	-	-	-	21	-	-	-	1400			21
	91	1	13	5	2	8	3	1	-	-	9	-	-	24	2200			33
	98	44	17	3	1	-	-	-	-	-	45	2	1	17	1300			65
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	600			30

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	63%	12%	00%	+ 3%
'91	65%	15%	39%	-16%
'98	30%	02%	11%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	3999	Dec:	35%
	'91	4132		53%
	'98	3480		37%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus stenophyllus																		
Y	85	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	13	2	-	-	-	-	-	-	-	14	1	-	-	1000	8	10	15
	91	5	3	-	1	-	-	-	-	-	5	1	3	-	600	9	11	9
	98	38	-	-	2	-	-	-	-	-	35	-	-	-	800	12	19	40
D	85	2	8	-	-	-	-	-	-	-	6	-	4	-	666			10
	91	5	2	1	3	-	-	1	-	-	4	-	-	8	800			12
	98	5	-	-	-	-	-	-	-	-	2	-	-	3	100			5
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	37%	00%	15%	-19%
'91	23%	05%	50%	-39%
'98	00%	00%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
'85	1799	Dec:		37%
'91	1466			55%
'98	900			11%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra fasciculata fasciculata																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	85	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	-	4	-	-	-	-	-	-	-	4	-	-	-	266			4
	98	4	4	-	-	-	-	-	-	-	8	-	-	-	160			8
M	85	-	3	-	-	-	-	-	-	-	3	-	-	-	200	15	11	3
	91	-	4	-	-	-	-	-	-	-	4	-	-	-	266	15	14	4
	98	1	2	4	-	-	-	-	-	-	4	-	3	-	140	20	27	7
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	1	-	-	-	-	-	-	-	-	-	1	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	100%	00%	00%	+50%
'91	100%	00%	00%	-40%
'98	44%	25%	25%	

Total Plants/Acre (excluding Dead & Seedlings)				
'85	266	Dec:		0%
'91	532			0%
'98	320			6%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	98	100	-	-	-	-	-	-	-	-	100	-	-	-	2000			100
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	3	-	-	-	-	-	-	-	-	1	-	2	-	200	9	7	3
	98	400	-	-	-	-	-	-	-	-	400	-	-	-	8000	8	9	400
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	2	-	-	1	-	-	-	-	-	-	-	-	3	200			3
	98	4	-	-	-	-	-	-	-	-	2	-	-	2	80			4
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	63%	+95%
'98	00%	00%	.39%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	0%
	'91	533		38%
	'98	10080		1%

Juniperus osteosperma																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'98	20		-

Leptodactylon pungens																		
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66	9	5	1
	91	-	-	-	3	-	-	-	-	-	3	-	-	-	200	7	5	3
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	10	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	+67%
'91	00%	00%	00%	-90%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	66	Dec:	-
	'91	200		-
	'98	20		-

Opuntia spp.

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	6	-	-	1	-	-	-	-	-	7	-	-	-	140	6	10	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'98	140		-

Pinus edulis

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66	69	71	1
	91	-	-	-	1	-	-	-	-	-	1	-	-	-	66	116	75	1
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	+ 0%
'91	00%	00%	00%	- 9%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	66	Dec:	-
	'91	66		-
	'98	60		-

Ribes cereum cereum

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	6	-	-	-	-	-	-	-	-	6	-	-	-	120	-	-	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'91	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'91	0		-
	'98	120		-